DOES TRAINING DEFINED BY SPEED ZONES ACCURATELY REFLECT RACEHORSE WORKLOAD?

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INTRODUCTION

Racehorse training remains largely based on anecdotal and traditional practices. Trainers aim to produce horses which are fit and can perform to their best at the races. A common approach in training is to define workload during training by the speed the horses are exercised at, for example: quarter speed (QS), half speed (HS), three quarter speed (TQS) and full speed (FS). Success is largely judged via observation by the trainer and the work rider. This approach could potentially risk overtraining and injuring the horses involved, if the speed or workload of the horses is different to that perceived to be undertaken by the trainer / rider.

Research objective: to evaluate if speed zones (SZ) and estimated workload varied in racehorses during mid-season training

Fig. 1: Racehorse completing gallop exercise (4 furlong, all-weather gallop: sand & carpet fibre mix, 8cm depth) wearing equinITy™ system (equinITy, 2018)

METHOD

- Sample: 9 'race-fit' TB racehorses, aged: 8.0±2.3 years, who had raced: 14±11 times and of variable ability (official rating: 103±14)
- EquinITy™ heart rate (HR) monitoring systems collected HR and speed data for each horse during all interval training for 6 weeks, in the middle of the British National Hunt (NH) season 17/18 (Fig. 1)
- Workload levels were set and assessed by the same, experienced NH trainer; typical week's training regime:

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
2xQS gallops*	1xFS gallop*	road-work	3xQS gallops*	road-work OR 2xHS gallops*	2xTQS & 1xFS gallop*	Horse walker (30mins)

**including 400m warm up pre-gallop, 350m trot in-between intervals & 500m walk after galloping*

- Workload (defined as age-adjusted mean percentage of HR maximum(Vincent et al., 2009) and speed for each gallop run were recorded and intended SZ were noted from the trainer
- Kruskal-wallis analyses and post-hoc Mann Whitney U tested if differences occurred in workload and speed between SZ

RESULTS

- Speed increased incrementally as SZ progressed (Fig.2)
- Racehorses' speed varied between furlongs within SZ (P = 0.0001)
- Post-hoc analyses found no difference between QS-HS for all furlongs (P>0.05)
- However, significant increases occurred between all SZ for F1, 2, 3 and 4 (P<0.01) between QS-TQS, QS-FS, HS-TQS, HS-FS and TQS-FS, except for F4 (P>0.05)
- Racehorse workload only varied with SZ for F1(P=0.003)
- Increased workload occurred between HS-FS, TQS-FS and QS-FS (P<0.02) but not between QS-HS, QS-TQS and HS-TQS (P>0.05; Fig. 3)

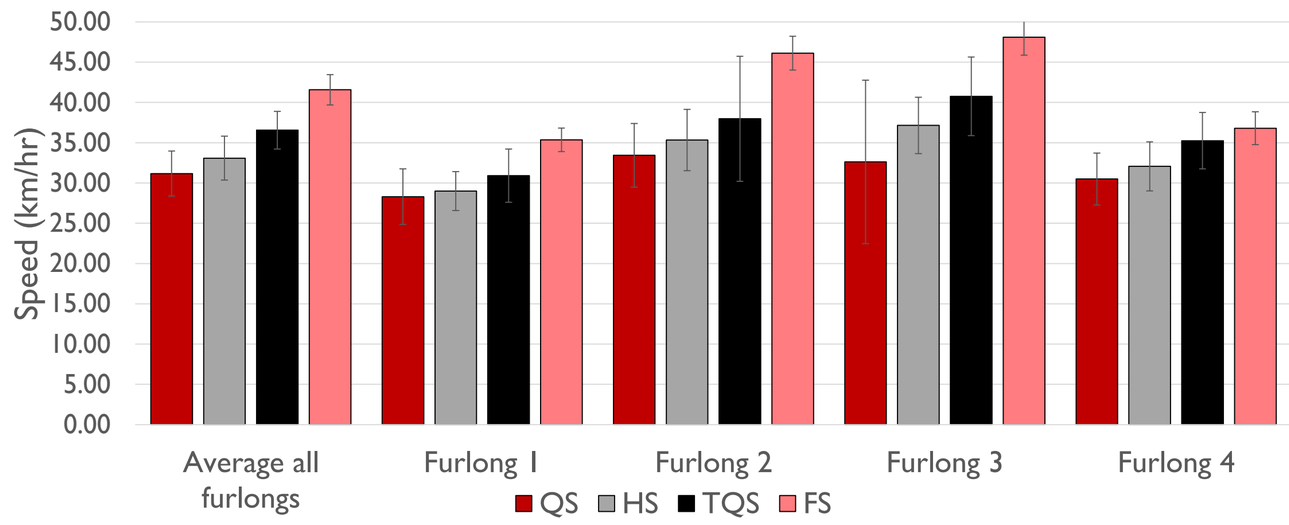

Fig. 2: Average speed (km/hour) of horses between furlongs for Trainer set speed zones.

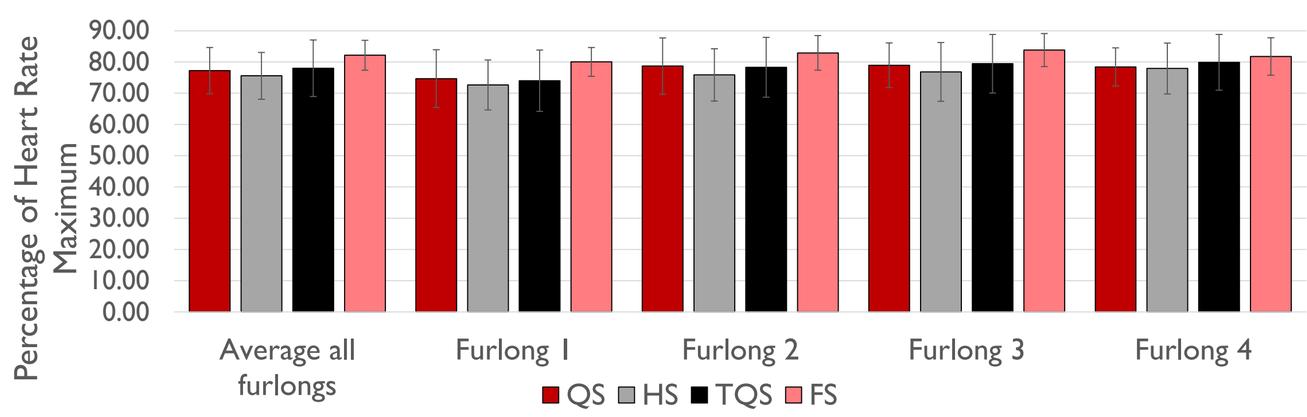

Fig. 3: HRmax. (%) horses were working at between furlongs for Trainer set speed zones.

DISCUSSION AND CONCLUSIONS

Speed did increase between the SZs but no difference was found between quarter and half speed work. Similarly, racehorse workload only varied during the first furlong of work, regardless of the SZ they were working at. These results suggest racehorse workload was not consistent across SZs for F2-4 and therefore these horses were not working as the trainer intended them to. Visual assessment of workload by the trainer did not identify this. Accurately monitoring speed and workload during galloping using technology could provide trainers with a more accurate approach to training than using speed zones and judging performance through observation.

REFERENCES: Vincent, TL, Newton, JR, Deaton, CM, Franklin, SH, Biddock, T, McKeever, KH, McDonough, P, Young, LE, Hodgson, DR and Marlin, DJ (2006) Retrospective study of predictive variables for maximal heart rate in horses undergoing strenuous treadmill exercise. Equine Veterinary Journal, 38 (s36), pp. 146-152.

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